SUPPORT FOR THE AMENDMENTS

Applicants have amended the Claims 1, 16, and 23 to recite that "said first n-octenylsuccinic anhydride-modified starch is a dextrinized n-octenylsuccinic anhydride-modified starch and said second n-octenylsuccinic anhydride-modified starch is a hydrolyzed n-octenylsuccinic anhydride-modified starch." Support for this amendment can be found on page 18, lines 12-15, and page 20, lines 1-7, of the specification. Applicants have also deleted exudate gums from the polymers of the "c" and "d" compositions.

No new matter has been added. Claims 1-26 remain active in this application.

REMARKS/ARGUMENTS

Present Claims 1-15 relate to encapsulation compositions, which comprise:

(A) an encapsulate, encapsulated in:

(B) a glassy matrix,

wherein said glassy matrix is selected from the group consisting of:

(a) a composition, comprising:

(a_1) 5 to 95 % by weight, based on the total weight of said composition (a), of a first n-octenylsuccinic anhydride-modified starch; and

(a_2) 5 to 90 % by weight, based on the total weight of said composition (a), of a second n-octenylsuccinic anhydride-modified starch; and

(a_3) 0 to 45 % by weight, based on the total weight of said composition (a), of a component selected from the group consisting of sugars, polyols, corn syrup solids, and mixtures thereof,

with the proviso that said first n-octenylsuccinic anhydride-modified starch is a dextrinized n-octenylsuccinic anhydride-modified starch and said second n-octenylsuccinic anhydride-modified starch is a hydrolyzed n-octenylsuccinic anhydride-modified starch;

(b) a composition, comprising:

(b_1) 5 to 95 % by weight, based on the total weight of said composition (b), of a first food polymer;

(b_2) 5 to 90 % by weight, based on the total weight of said composition (b), of a second food polymer; and

(b_3) 0 to 45 % by weight, based on the total weight of said composition (b), of a component selected from the group consisting of sugars, polyols, corn syrup solids, and mixtures thereof,

wherein said first food polymer is an n-octenylsuccinic anhydride-modified starch, and

wherein said second food polymer is selected from the group consisting of exudate gums, bacterial gums, extract gums, seed gums, pectins, dextrins, pregelatinized starches, agar agar, polydextrose, hydrogenated starch hydrolyzates, modified celluloses, seaweed hydrocolloid extracts, proteins, fractionated proteins, hydrolyzed proteins, and chitosan;

(c) a composition, comprising:

(c_1) 5 to 95 % by weight, based on the total weight of said composition (c), of a first food polymer;

(c_2) 5 to 90 % by weight, based on the total weight of said composition (c), of a second food polymer; and

(c_3) 0 to 45 % by weight, based on the total weight of said composition (c), of a component selected from the group consisting of sugars, polyols, corn syrup solids, and mixtures thereof,

wherein said first food polymer and said second food polymer are selected from the group consisting of bacterial gums, extract gums, seed gums, pectins, dextrins, maltodextrins, pregelatinized starches, agar agar, polydextrose, hydrogenated starch hydrolyzates, modified

celluloses, seaweed hydrocolloid extracts, proteins, fractionated proteins, hydrolyzed proteins, and chitosan,

with the proviso that said first food polymer and said second food polymer are different from each other; and

(d) a composition, comprising:

(d_1) 5 to 95 % by weight, based on the total weight of said composition (d), of a first food polymer;

(d_2) 5 to 70 % by weight, based on the total weight of said composition (d), of a second food polymer;

(d_3) 5 to 70 % by weight, based on the total weight of said composition (d), of a third food polymer; and

(d_4) 0 to 45 % by weight, based on the total weight of said composition (d), of a component selected from the group consisting of sugars, polyols, corn syrup solids, and mixtures thereof,

wherein said first food polymer and said second food polymer are selected from the group consisting of bacterial gums, extract gums, seed gums, pectins, dextrins, pregelatinized starches, agar agar, polydextrose, hydrogenated starch hydrolyzates, modified celluloses, seaweed hydrocolloid extracts, proteins, fractionated proteins, hydrolyzed proteins, and chitosan, and

wherein said third food polymer is selected from the group consisting of n-octenylsuccinic anhydride-modified starches, bacterial gums, extract gums, seed gums, pectins, dextrins, maltodextrins, pregelatinized starches, agar agar, polydextrose, hydrogenated starch hydrolyzates, modified celluloses, seaweed hydrocolloid extracts, proteins, fractionated proteins, hydrolyzed proteins, and chitosan,

with the proviso that said first food polymer, said second food polymer, and said third food polymer are all different from each other.

Present Claims 23-26 relate to processes for preparing such a composition, and Claim15-22 relate to compositions prepared by such a process.

The present inventors have discovered that the presently claimed compositions are particularly effective for the encapsulation of materials. The cited references neither disclose nor suggest the presently claimed compositions or processes. Accordingly, these references cannot affect the patentability of the present claims.

The provisional rejection of Claims 1-4 and 9-26 under the judicially created doctrine of obviousness-type double patenting in view of Claims 1, 4-9, 11, 12, and 17-39 of co-pending application serial no. 10/864,631; the rejection of Claims 1-4 and 9-26 under the judicially created doctrine of obviousness-type double patenting in view of Claims 1-33 of U.S. Patent No. 6,652,895; the rejection of Claims 1-4 and 9-26 under the judicially created doctrine of obviousness-type double patenting in view of Claims 1-28 of U.S. Patent No. 6,790,453; the rejection of Claims 1-4 and 9-26 under 35 U.S.C. § 102(e) in view of U.S. Patent No. 6,652,895; the rejection of Claims 1-4 and 9-26 under 35 U.S.C. § 102(e) in view of U.S. Patent No. 6,416,799; the rejection of Claims 1-4 and 9-26 under the judicially created doctrine of obviousness-type double patenting in view of Claims 1-21 of U.S. Patent No. 6,416,799; the rejection of Claims 1-4 and 9-26 under 35 U.S.C. § 102(b) in view of U.S. Patent No. 6,187,351; the rejection of Claims 1-4 and 9-26 under 35 U.S.C. § 102(b) in view of U.S. Patent Nos. 5,897,897 or 5,603,971; the rejection of Claims 1-26 under 35 U.S.C. § 103(a) in view of U.S. Patent Nos. 5,897,897 or 5,603,971; and the rejection of Claims 1-4 and 9-26 under 35 U.S.C. § 102(b) in view of U.S. Patent Nos. 5,009,900 and 5,087,461 are respectfully traversed.

Simply put, none of the cited references disclose or suggest the presently claimed compositions or processes.

N-octenylsuccinic anhydride-modified starches ("OSAN-starches") are characterized under the 21CFR §172.890, and include both "dextrinized" and "hydrolyzed" materials. However, the "hydrolyzed" materials are in fact more like octenylsuccinic anhydride modified maltodextrins (see 21 CFR § 184.1444). The "dextrinized" OSAN-starches show "card-boardy" off-flavors. Thus, the hydrolyzed OSAN-starches are more desirable from organoleptic considerations. However, another key functionality is in their melting and plastic flow characteristics that the different starches segregate themselves into the functional and non-function categories, thus, providing functional processing and physical properties when combined, i.e. desirable melt-flow, good elastic recovery and blander organoleptic character.

For the Examiner's convenience, the physical differences of the various commercial OSAN-starches are summarized presented below.

I. Dextrinized OSAN-modified starch (Capsul E (corn based, National Starch), Capsul TA (tapioca based, National Starch), Miracap (corn based, Tate & Lyle)):
Process of production: The modified starch is prepared by dextrinization in a silo of a waxy maize or a tapioca starch under low pH, low moisture, and high heat conditions. Then the dextrinized starch is modified with octenyl succinic acid anhydride by addition of the octenyl succinic anhydride to a waxy maize or tapioca starch by adding the solid anhydride to the starch powder, mixing and then heating the mixture to elicit dextrinization in a bulk chamber. This process yields a simultaneous dextrinization and chemical modification of the starch

Structure: Many original native starch granules are present in the dispersion of the final modified starch

Typical pH in 5% solution: 2.9-3.1 (Capsul E) or 6.5 (Miracap)

Color: gray yellow to brown (Capsul E) or white to off-white (Miracap)

Sensory evaluation in solutions: Significant acidity, cardboard, astringent, burning aftertaste.

Viscosity, cp @ 80°F (Brookfield RVT): 100 cp @ 30% solids

Properties in the melt: low viscosity, low elastic recovery (1.0-1.1, no expansion), quickly setting into a glassy state.

Glass transition properties of the extruded and cooled melt @ 8% moisture: glass transition temperature 45-50°C, heat capacity change 0.2 J/g/°C.

II. Enzymatically hydrolyzed OSAN-modified starch (Emap12634 (Cargill), Hi-Cap100 (National Starch))

Process of production: The starch is prepared by enzymatic hydrolysis of a waxy maize starch at slightly elevated temperature and chemical modification with octenyl succinic acid anhydride.

Structure: No original native starch granules are present in dispersion.

Typical pH in 5% solution: 5.0-5.5

Color: white

Sensory evaluation in solutions: clean starch, no significant off-notes

Viscosity, cp @ 80°F (Brookfield RVT): 359 cp @ 30% solids

Properties in the melt: low viscosity, high elastic recovery (1.3-1.6), slowly setting into a glassy state

Glass transition properties of the extruded and cooled melt @ 8% moisture: glass transition temperature 35-42°C, heat capacity change 0.1 J/g/°C.

III. Acid hydrolyzed OSAN-modified starch (Emcap12639 (Cargill)):

Process of production: The starch is prepared by acid hydrolysis of a waxy maize starch and followed by chemical modification with octenyl succinic acid anhydride.

Structure: No original native starch granules are present in dispersion.

Typical pH in 5% solution: 5.5

Color: white

Sensory evaluation in solutions: clean starch, bland, no significant off-notes

Viscosity, cp @ 80°F (Brookfield RVT): 600 cp @ 30% solids

Properties in the melt: high viscosity, high elastic recovery (1.3-1.6), slowly setting into a glassy state

Glass transition properties of the extruded and cooled melt @ 8% moisture: glass transition temperature 35-42°C, heat capacity change 0.1 J/g/°C.

As for the "a" compositions, Claims 4-6, none of the cited references disclose or suggest a composition which contains both a dextrinized OSAN starch and a hydrolyzed OSAN starch. For this reason, these claims are patentable over the cited references.

As for the "b" compositions, *i.e.*, the binary polymer system utilizing an OSAN starch and a non-OSAN starch, Claims 7 and 8, the issue of polymer immiscibility is a novel and

distinguishing property of the composition. The polymer literature has extensive documentation that two different classes of polymers when melted do not mix. In contrast, the polymers of the "b" composition are selected for good miscibility.

In the case of the "c" compositions, claims 9 and 10, these cover binary mixtures of food polymers (excluding OSAN starches). Accordingly, the miscibility and the polymer-polymer incompatibility issues described above in connection with the "b" compositions also apply to these compositions. However, once again, the polymers of the "c" composition are selected for good miscibility.

The "d" compositions, Claims 11 and 12, also reflect the same miscibility and the polymer-polymer incompatibility issues noted above for the "b" and "c" compositions.

Finally, as for U.S. Patent No. 6,790,453, Applicants have amended the claims to delete the exudate gums from the "c" and "d" compositions.

For all of these reasons, the rejections should be withdrawn.

Applicants submit that the present application is now ready for examination on the merits, and early notification of such action is earnestly solicited.

Respectfully submitted,

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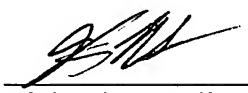

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